Allegany Ballistics Laboratory
Site 1 Soil Remedial Action

Design, Planning, and Construction

Presented By
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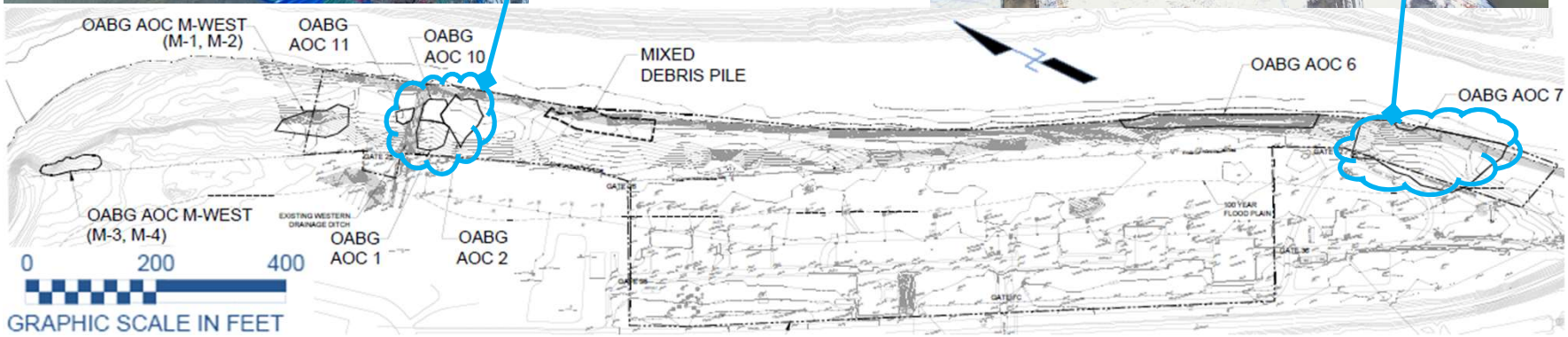
Mid-Atlantic (MIDLANT)

Objective

Present an overview of the Site 1 Soil Remedial Action at Allegany Ballistics Laboratory (ABL) including: design challenges, construction experience, and associated comprehensive remedial strategy.



Photos courtesy CH2M; Figure Courtesy Tetratech EC

Agenda

- Background
- Remedial Design Challenges
- Remedial Action - Construction Experience
- Lessons Learned
- Moving Forward - Optimization
- Knowledge Check
- Summary

Background - Location

Overview of ABL Plant 1 and Plant 2
showing location of Site 1 ⇨

Overview of Site 1 showing various Areas of Concern (AOC)s

- **Active Burning Ground (ABG) is the rectangular location in the middle.**
- **The extended area along the river bank is the Outside Active Burning Ground (OABG) area; focus of this discussion.**

Figures courtesy of Tetratech EC

Background - History

Site 1 Historical Usage

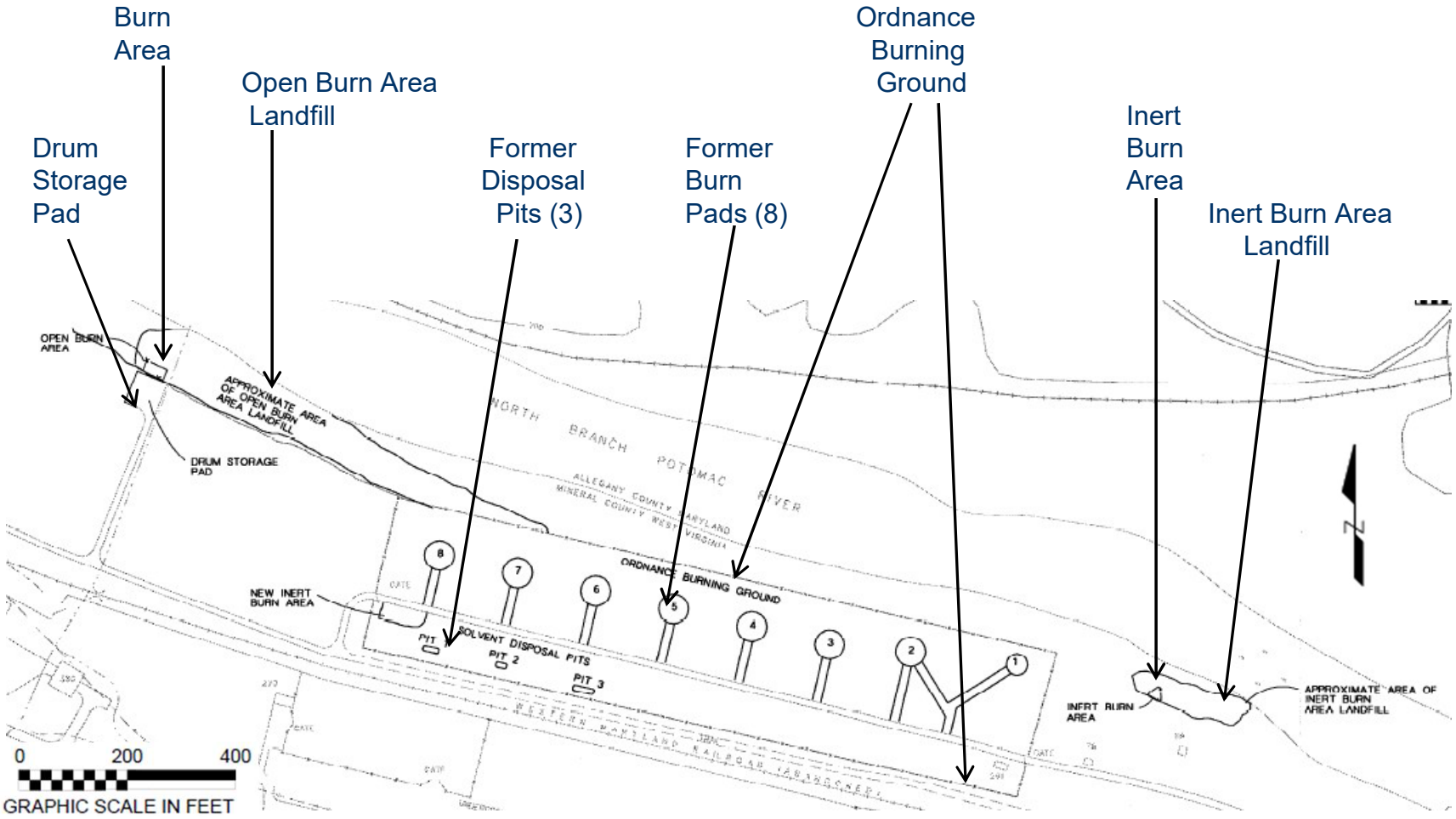


Figure courtesy CH2M

Background – Risk Drivers

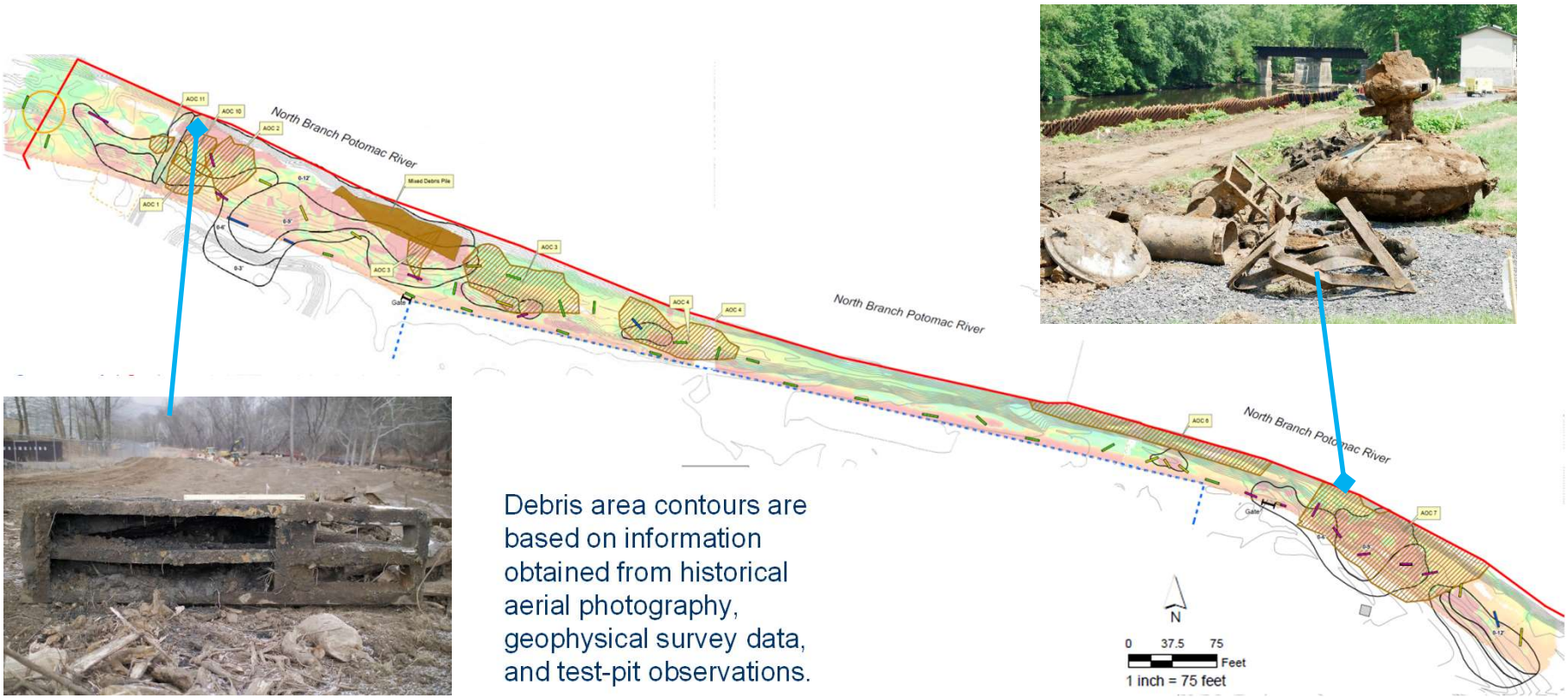
Risk Driver COCs at OABG AOCs

AOC 1	OABG Risk Drivers																		Summary	History
	VOCs				PAHs				Explosives			Metals								
	Methyl Acetate	1,2-DCE	PCE	TCE	Benzo(a) anthracene	Benzo(a) pyrene	Total Low MW PAHs	Total High MW PAHs	HMX	NG	RDX	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Vanadium		
1	X			X															VOC's	Open Burn Area Landfill
2				X															TCE	Open Burn Area Landfill
3	X	X		X		X		X					X		X	X		X	VOC, PAH, METALS	
4				X															TCE	
5				X															TCE	
6		X		X										X					VOC, Cobalt	
7	X		X	X					X	X	X	X	X		X	X	X		Explosives, metals, VOCs	Inert Burn Area
10														X	X				Metals	Open Burn Area Landfill
11					X	X	X	X						X					PAH, Cobalt	Open Burn Area
AOC M West														*	*				Risk revised after further evaluation	surface debris
Mixed Debris Pile																			Subsurface Debris	strong metals signal, exposure along river
Basis of Risk Driver	ECO	ECO & SSL	SSL	SSL	SSL	IND	ECO	ECO	ECO	SSL	SSL	ECO & SSL	ECO	BG	ECO & SSL	ECO & SSL	ECO & SSL	ECO		

Derived from table developed by CH2M.

Background - Debris

Illustration showing the estimated extent of OABG surface and subsurface debris



Debris area contours are based on information obtained from historical aerial photography, geophysical survey data, and test-pit observations.

Photos and Figures courtesy of CH2M

Background – RAOs and SRGs

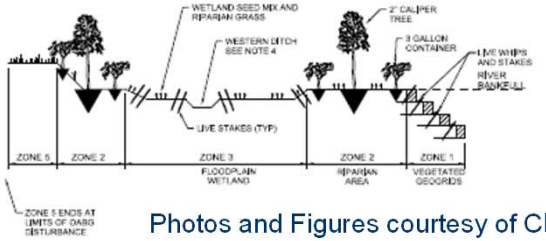
Remedial Action Objectives (RAOs)

- ❖ Prevent or minimize
  - – Direct contact with soil Contaminants of Concern (COCs)
  - – Migration of soil COCs to the river.
  - – Migration of COCs to groundwater.

- Site Remediation Goals (SRGs) derived from:
  - Risk-based concentrations (HH and ECO)
  - Soil Screening Levels (leaching concentrations)
  - Facility-wide background as applicable

- ❖ Remove surficial debris

- ❖ Control erosion and riverbank scour



Photos and Figures courtesy of CH2M

Background – Defining AOCs

Soil Boring Locations and OABG Areas of Concern

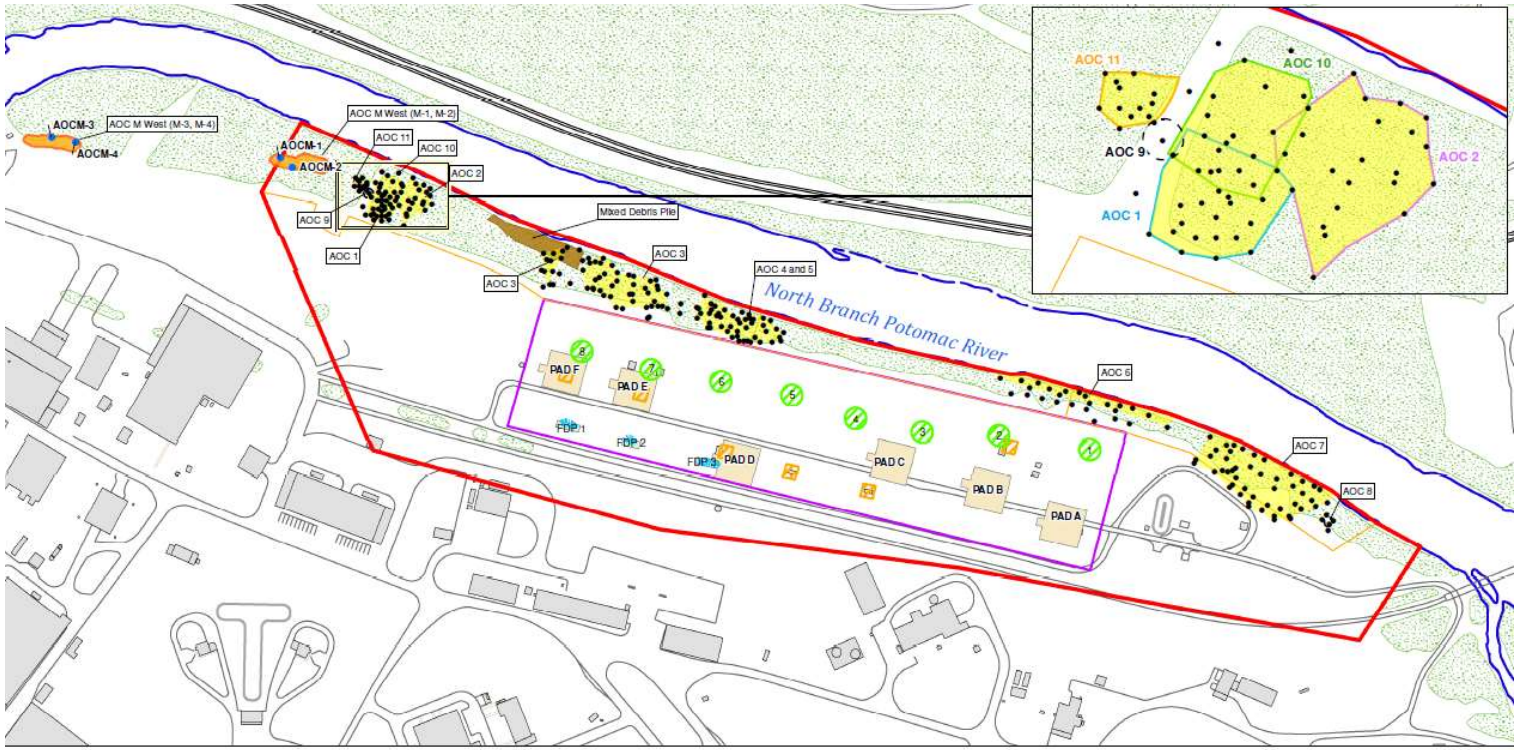


Figure 1-4
Soil Boring Locations at OABG Areas of Concern
Basis of Design Report for Site 1 Soil Operable Unit 4 - Outside Active Burning Ground
Allegany Ballistics Laboratory, Rocket Center, West Virginia

ch2m.

Figure courtesy of CH2M

Background – Defining AOCs

OABG Areas of Concern

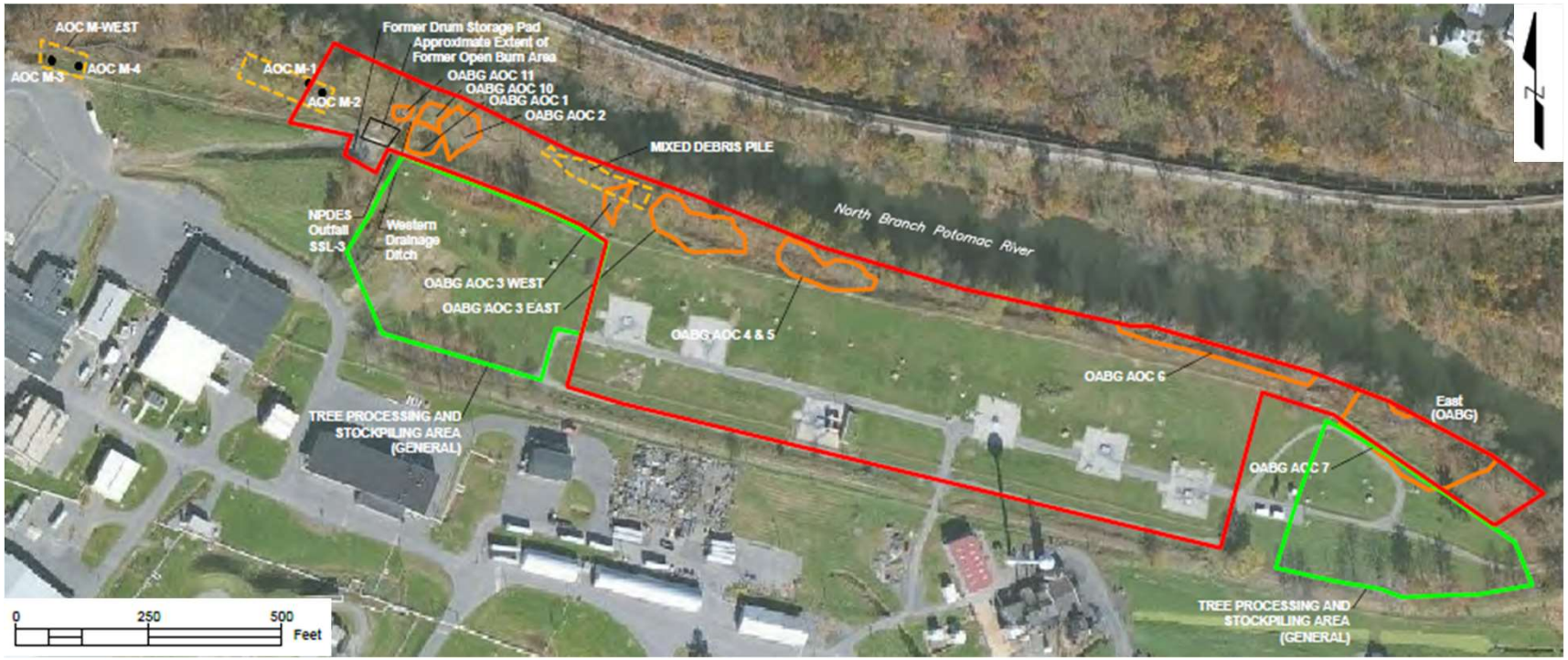
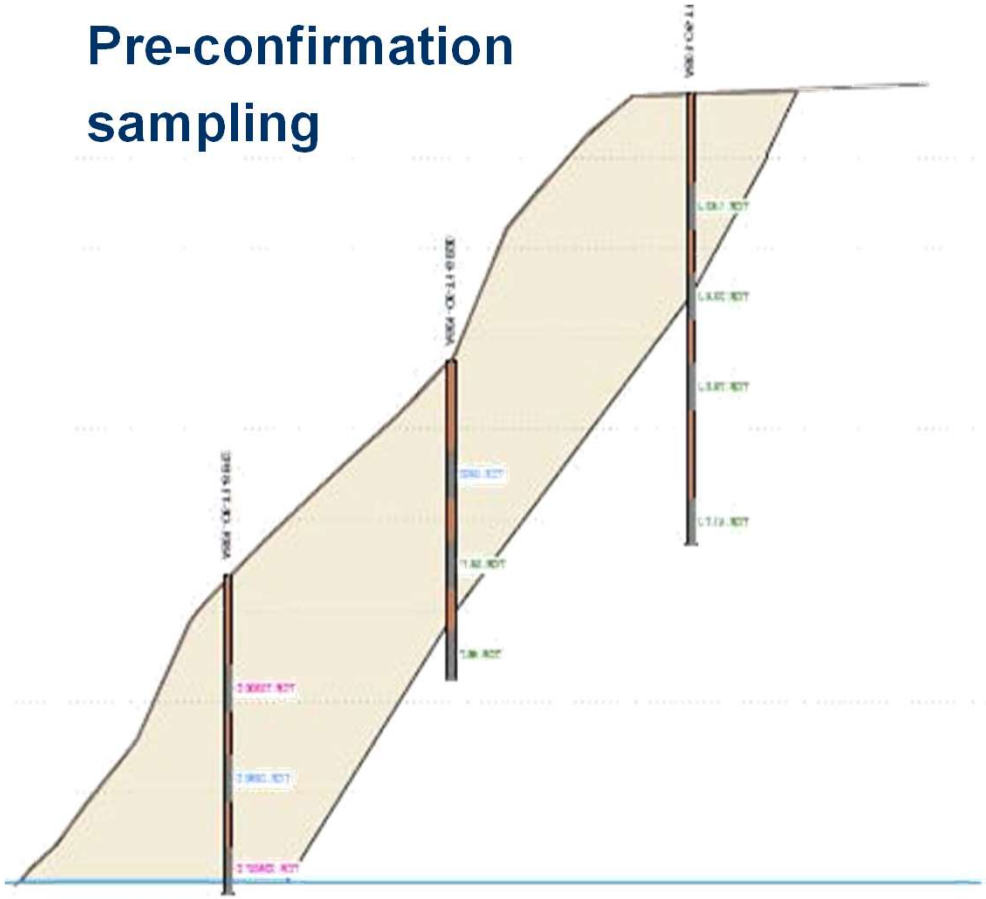
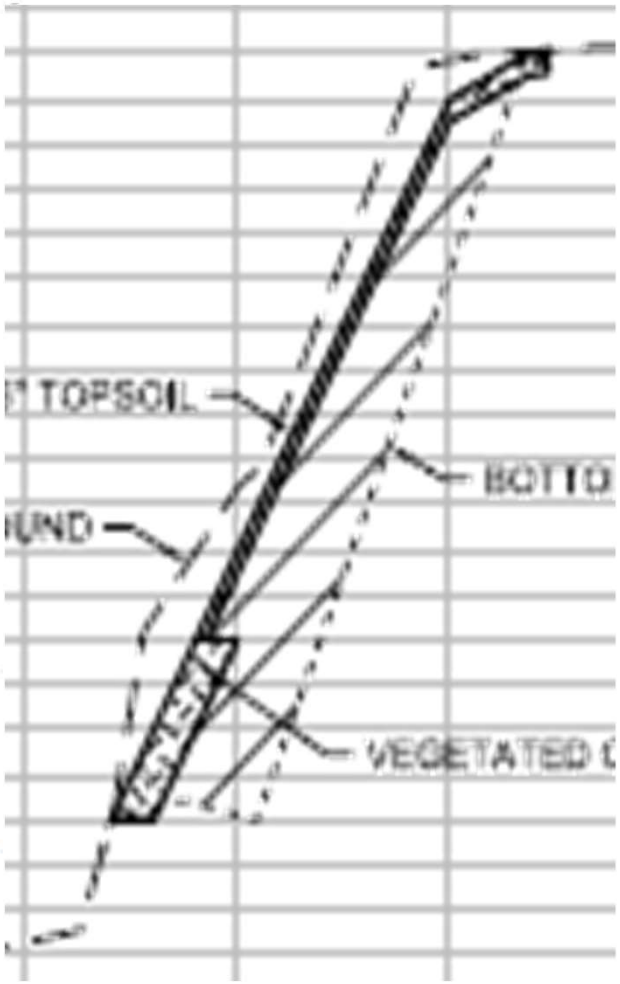


Figure courtesy of Tetratech

Remedial Design

Pre-confirmation sampling





Figures courtesy of CH2M

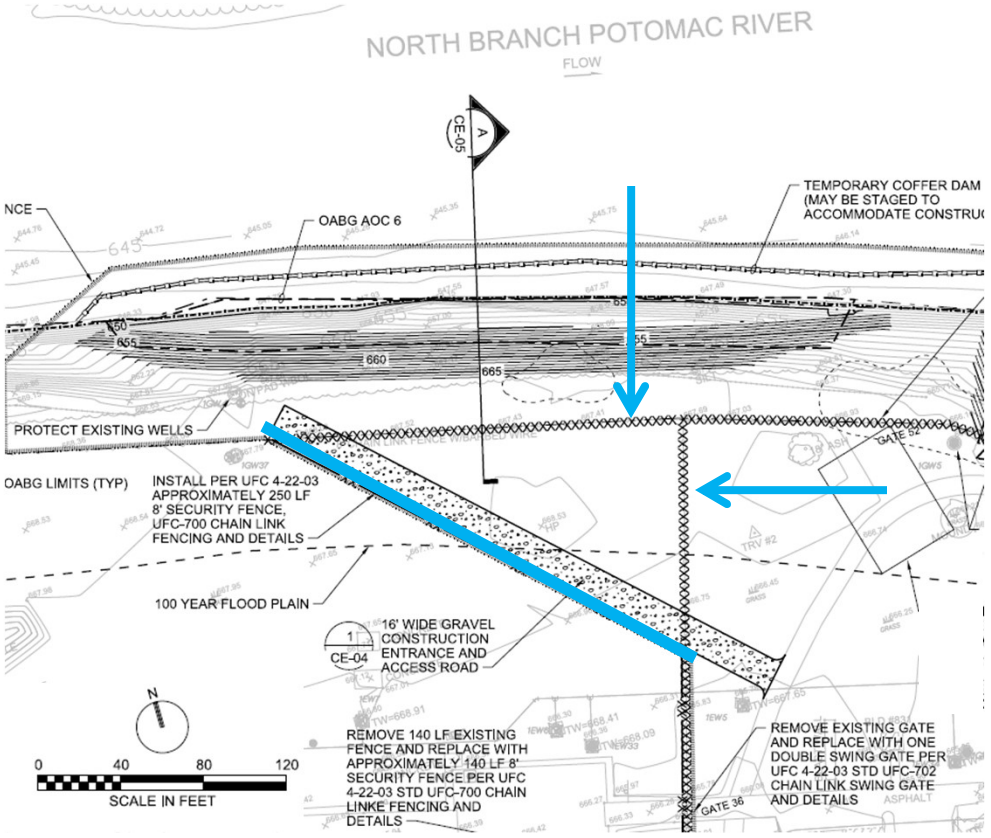
Remedial Design

Constructibility Review

A review of the plans and specifications to evaluate the "buildability" of the design.

- Evaluates the design for accuracy and completeness.
- Opportunity to identify impractical and inefficient remedial action requirements
- Opportunity to identify deficiencies in contract documents.
- Ensure drawings and specifications are unambiguous and compatible.

➢Typically done by FEAD or another A/E firm at the 100% Remedial Design milestone.



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Remedial Design

Stakeholder Involvement

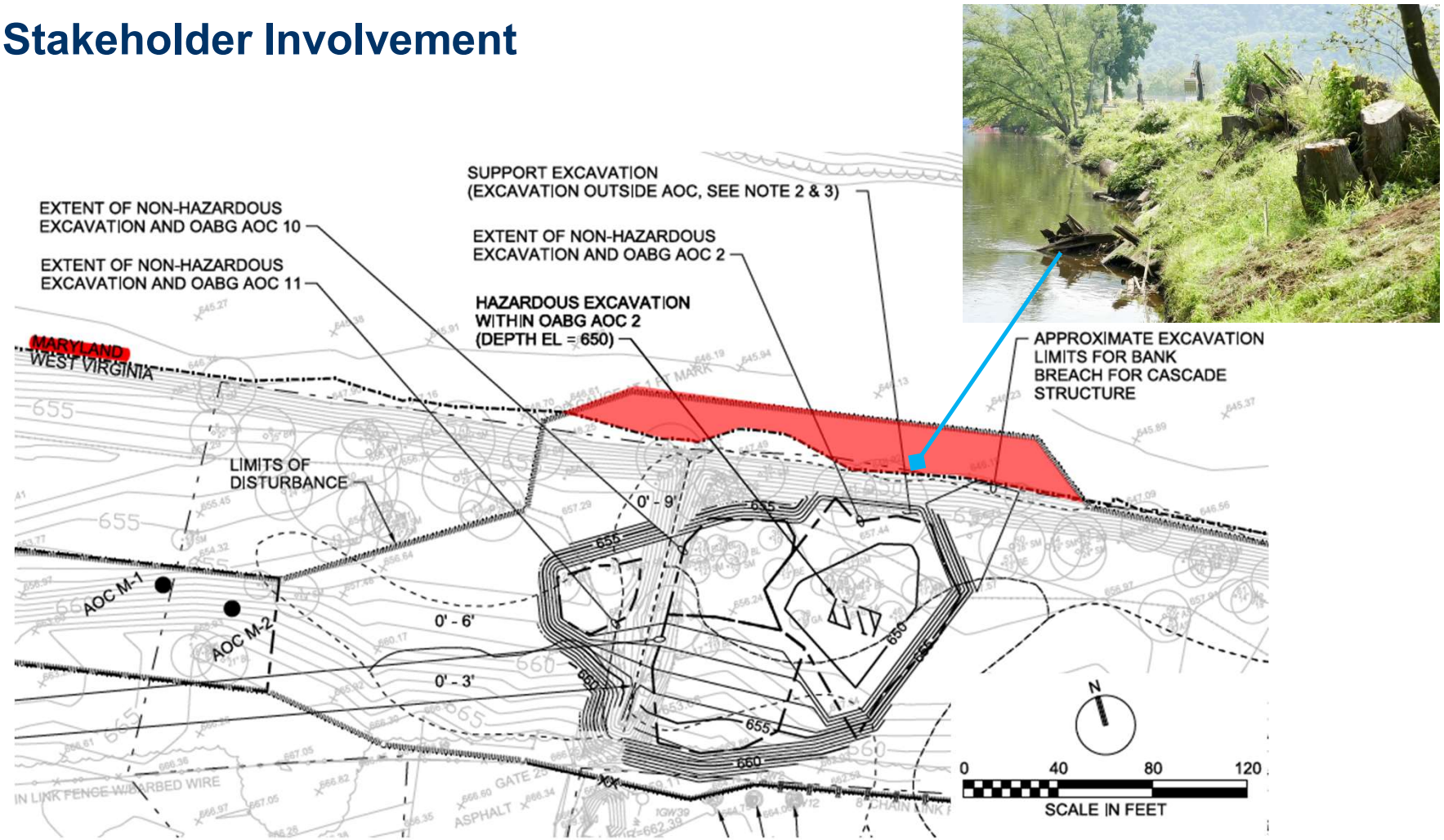


Photo and Figure courtesy of CH2M

Remedial Construction

Stakeholder Involvement

- Partnering Team
  - NAVFAC
  - NAVSEA
  - Environmental Protection Agency (EPA)
  - WV Dept. of Environmental Protection (WVDEP)
  - CLEAN contractor
- Maryland Department of Environment (MDE)
- Biological Technical Assistant Group (BTAG)
- Army Corps of Engineers (ACOE)
- Maryland (MD) Waterways
- Facility Operator
  - Security
  - Burn operations
- Groundwater Treatment Plant (GWTP) operator

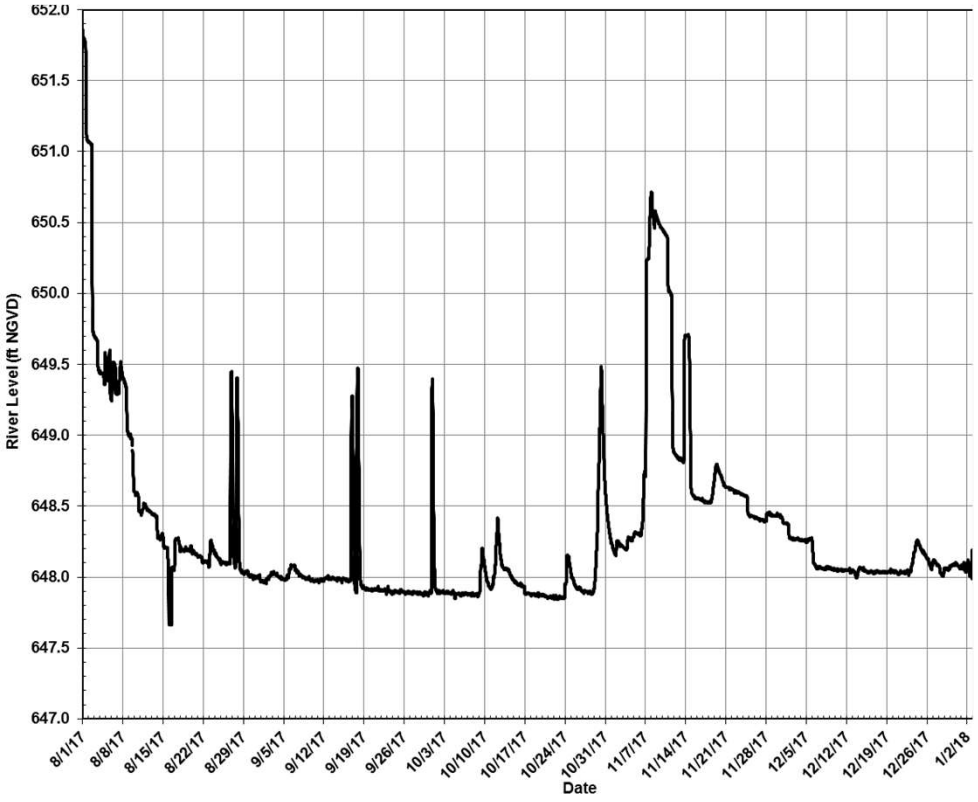


Figure courtesy of APTIM

Remedial Construction

Teamwork

- Partnering Team
  - –NAVFAC
  - –NAVSEA
  - –EPA
  - –WVDEP
  - –CLEAN
- BTAG
- Facility Operator
  - –Security
  - –Burn operations
- GWTP operator
- Blow In Place
  - –EOD
  - –Facility Operator
  - –WVDEP
  - –EPA

Photos courtesy of CH2M

Remedial Construction

Stakeholder involvement:

	ISSUES										
	River Debris ARAR		Removing Cofferdams During Spawning		Dam Control		Fencing		Knotweed Control		Blow In Place
STAKEHOLDER	Initial Position	Resolution	Initial Position	Resolution	Initial Position	Resolution	Initial Position	Resolution	Initial Position	Resolution	Coordination
NAVFAC*	No	OK	Uncertain	OK	Doubtful	OK	OK	OK	Uncertain	OK	Initiated
NAVSEA*	No	OK	~~	~~	~~	~~	OK	OK	Uncertain	OK	Required
EPA/BTAG*	No	OK	Defer to MD	OK	~~	~~	~~	~~	Unknown	OK	Emerg Permit
WVDEP*	No	OK	~~	~~	Yes	OK	~~	~~	~~	OK	Emerg Permit
CLEAN*	No	OK	~~	~~	~~	~~	OK	OK	Uncertain	OK	~~
RAC	No	OK	Yes	OK	Yes	OK	OK	OK	Uncertain	OK	Discovery
MDE	Yes	Incidental Removal	~~	~~	~~	~~	~~	~~	~~	~~	~~
MD Waterways	~~	~~	Unknown	Yes	~~	~~	~~	~~	~~	~~	~~
ACOE	~~	~~	~~	~~	Unknown	Yes	~~	~~	~~	~~	~~
Facility Contractor	~~	~~	~~	~~	~~	~~	Requested	Satisfied	Uncertain	OK	Assisted w/ Emerg. Permit
GWTP Operator	~~	~~	~~	~~	~~	~~	Requested	Satisfied	~~	~~	~~
EOD	~~	~~	~~	~~	~~	~~	~~	~~	~~	~~	"On our way!"

~~ means not involved in discussion

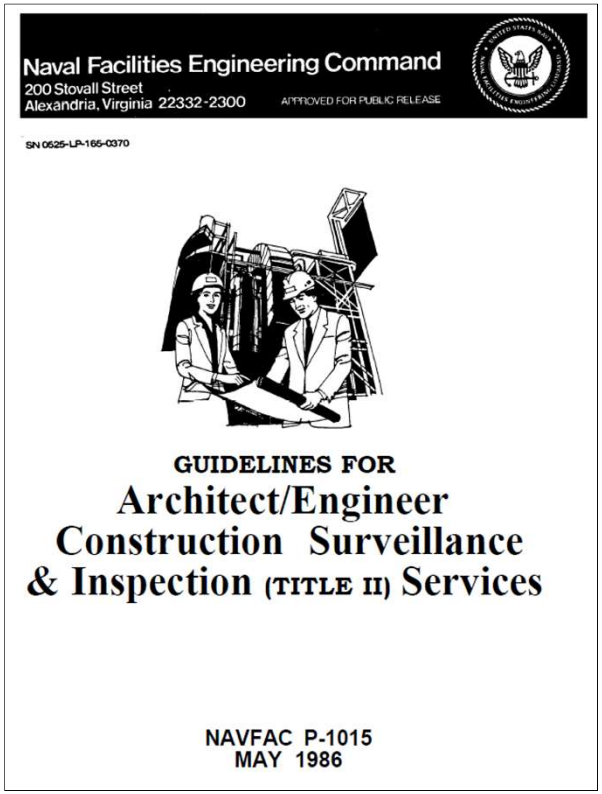
* Partnering Team

Remedial Action – Title II Services

Title II Inspection Services: construction quality assurance provided by an A/E firm

- **Considerations**
  - –Technical complexity
  - – Remote location
  - – Workload exceeds resources (FEAD)
  - – Impact (adherence to requirements)

- **Typically uses the design firm.**
  - – Typically funded with SIOH funds
  - – Not redundant between Title II and FEAD

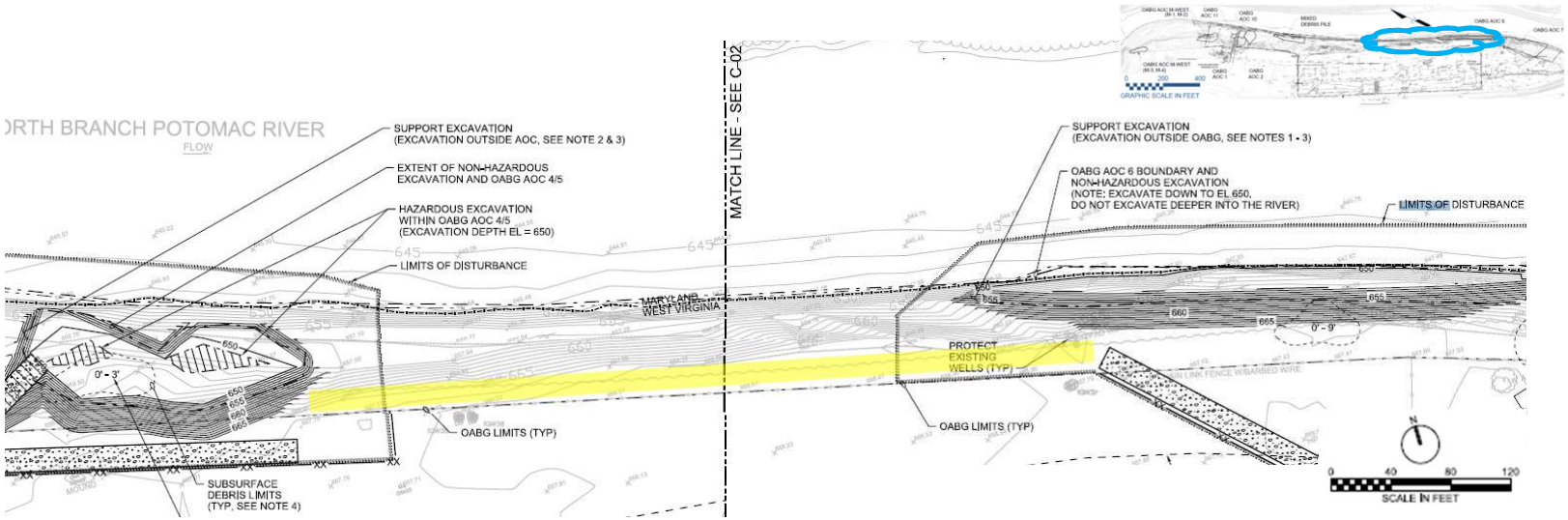


- **Tasked a hybrid Title II/Post-Design Services:**
  - –On-site quality assurance for all submittals; provide technical recommendations
  - –Ability to report real-time design deviations for review and adjustment
  - –Does not delegate field office's responsibilities

Remedial Action – Title II Services

Construction Quality Assurance

- **Benefits:**
  - –Objective perspective on RAC activities.
  - –Formalizes CLEAN involvement in problem solving.
  - –Increased level of experience onsite.
  - –Ability to respond quickly to arising issues.



Figures and photo courtesy of CH2M

Lessons Learned

Establishing teamwork and engaging stakeholders early is key to address unforeseen situations and conflicting opinions or expectations.

- **Remediation Goals and RAOs:**
  - Agreement on statistical methods mitigated regulators' dogged expectations to use leaching-based SSLs, ending a 7-year stalemate for the Feasibility Study.
- **Remedial Design**
  - Early coordination with stakeholders (bordering state) provided time to address concerns.
  - Data collection planning achieved agreement that confirmation sampling is not needed.
- **Constructibility review:**
  - Collaboration with the RAC early built teamwork between RAC, CLEAN, and Navy.
  - **NOTE:** Rather than expose the project to the risks of contracting the RAC too early:
    - » Schedule pre-mobilization design engineering and construction team face-to-face Q&A sessions for interactive collaboration and understanding of the project complexities.
- **Remedial Action - Construction experience**
  - Continued coordination, teamwork, and communication between Navy, regulators, RAC, and CLEAN, and key stakeholders helps progress.
- **Title II:**
  - Communicating roles of RAC, CLEAN, Construction Manager, and RPM up front helps teamwork from the start, which is key for open communication among all parties.
  - Key on-site CLEAN and RAC personnel need to be identified and more involved together earlier.
    - » Personnel changeover on both sides rebooted efforts for collaborative teamwork between key individuals.

Considerations for Optimization

"Comprehensive Remediation Strategy"

- Interactions between the Groundwater and Soil Operable Units.
- Collaboration on schedules benefits the follow-up optimization.

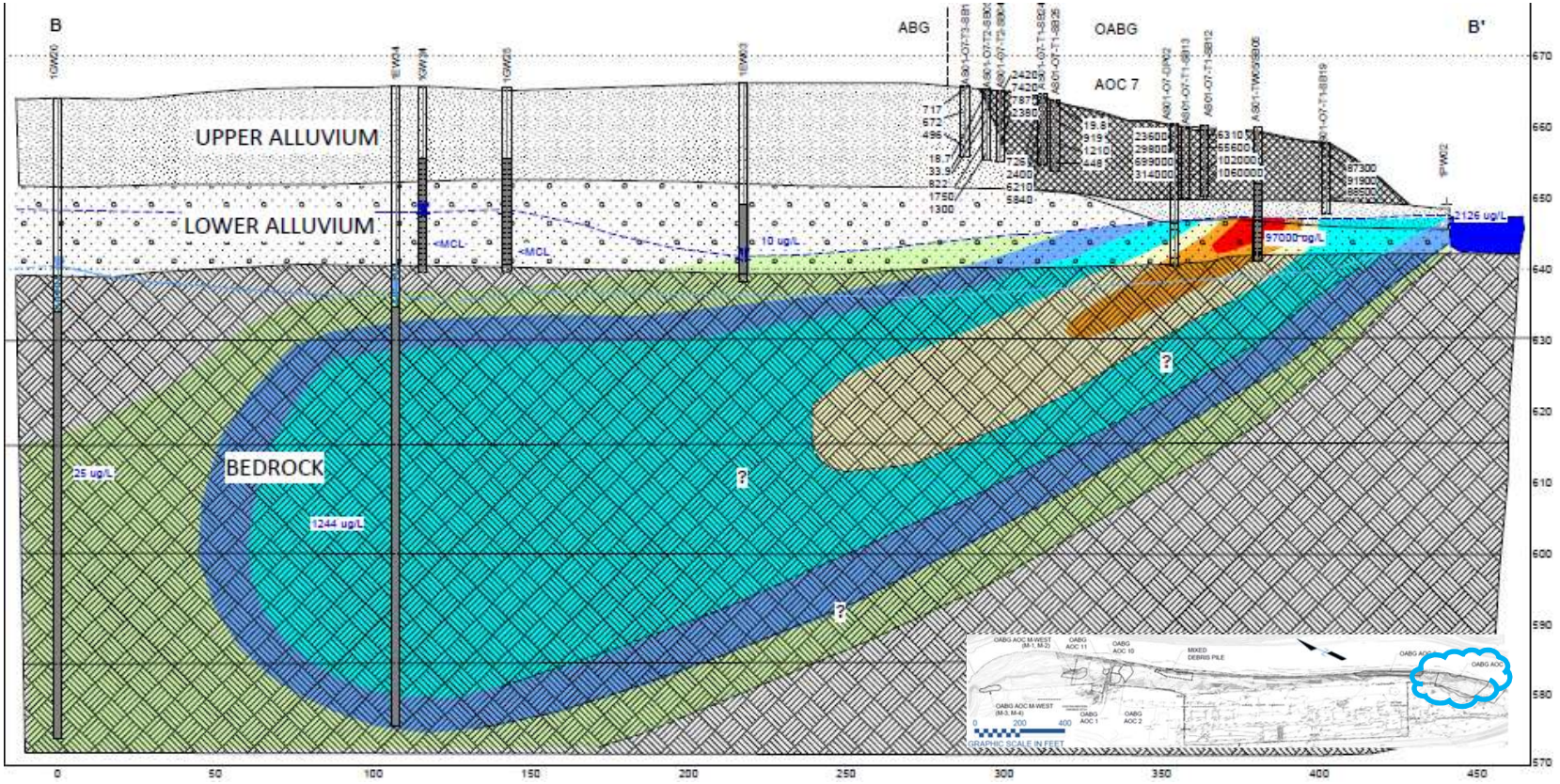
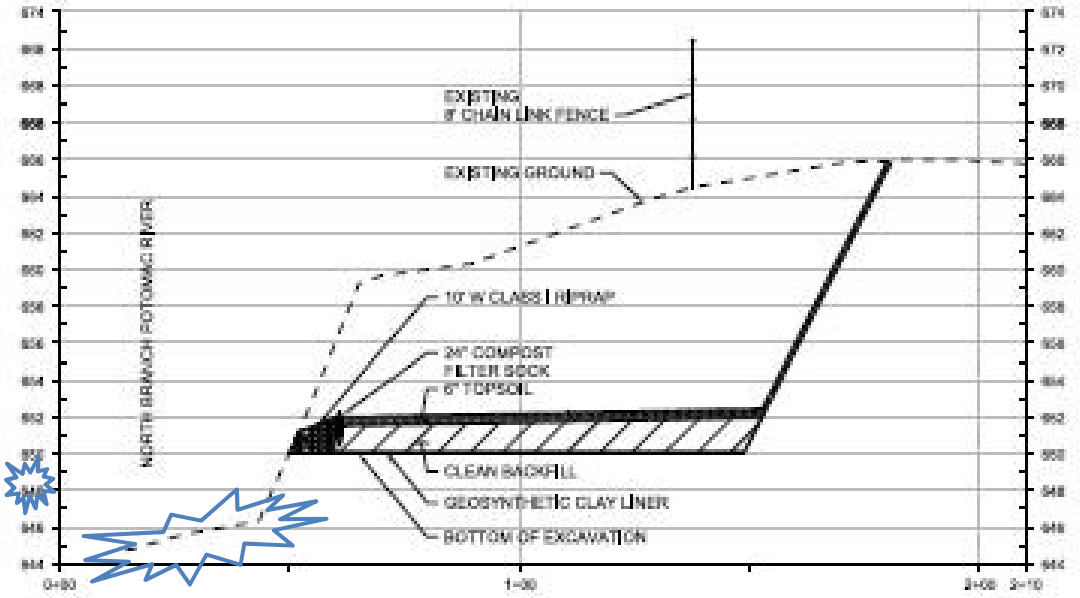


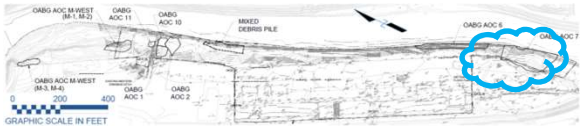
Figure Courtesy of CH2M

Considerations for Optimization

Plans

- Soil Remedy
  - Removal of the vadose contamination – ongoing.
  - Design calls for re-establishing the floodplain.
- Groundwater Remedy Optimization
  - Make use of the soil remedy to evaluate for a possible treatability study.





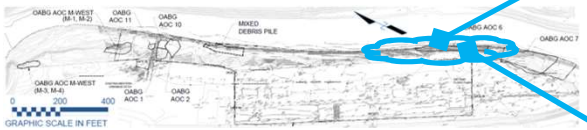
Figures courtesy of CH2M

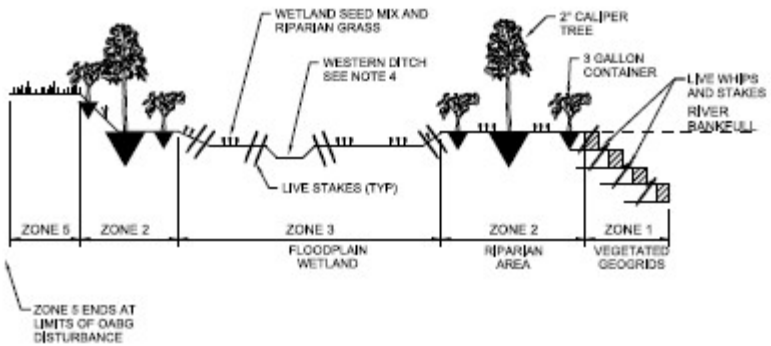
Considerations for Optimization

Plans

- Establish an interim restoration that could be accessed with direct push equipment
- Prevent damaging the more complex permanent restoration
- Permanent restoration delayed

Site access from construction activities has led to better understanding of the media (cobble zone and river bed).





Figures and photos courtesy of CH2M

Knowledge Check

1. A process that evaluates the design for accuracy and completeness and ensures drawings and specifications are unambiguous and compatible:
   a) Constructibility Review
   b) Title II management
   c) Editing
   d) Design Change Request

2. Contracting Title II oversight with an A/E firm should be considered based on technical complexity, _____, workload, impact.

3. Select key principles for successful project management:
   a) Communication
   b) Teamwork
   c) A and B.

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Summary

- **Background**
  - –Use of statistical methods
  - –Robust data collection
- **Remedial Design**
  - –Early coordination with stakeholders
  - –Constructibility reviews
- **Remedial Action - Construction**
  - –Title II oversight
  - –Teamwork
  - –Communication

- **Considerations for Optimization**
  - –Comprehensive Remediation Strategy between interacting Operable Units

Photo courtesy of CH2M

Contacts and Questions

Points of Contact

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- walt.j.bell@navy.mil

Questions ?

Teamwork and Collaboration

"Tell the crew for me that there are four ways of doing things aboard my ship: the right way, the wrong way, the Navy way, and my way. They do things my way, and we'll get along."

- Capt. Queeg, the Caine Mutiny.

Supplemental Information

NAVFAC Guidelines for Architect/Engineer Construction Surveillance & Inspection (Title II) Services, P-1015, May 1986

NAVFAC Construction Quality Management Program, P-445, June 2000